



About Embedded Event Manager

This chapter describes how to configure the EEM to detect and handle critical events on a device.

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Feature History for EEM

[Table 1: Feature History for EEM, on page 1](#) lists the release history for this feature. Only features that were introduced or modified in Release 3.x or a later release appear in the table.

Table 1: Feature History for EEM

Feature Name	Releases	Feature Information
EEM	8.1(1)	Added cli keyword to the actionnumber command.
Zone, FCNS, and FLOGI	6.2(11)	This feature enables users to configure custom limits for default Zone, FCNS, and FLOGI system policies.
EEM	4.1(3)	New chapter on configuring Embedded Event Manager (EEM) has been added.

Information About EEM

Embedded Event Manager monitors events that occur on your device and takes action to recover or troubleshoot these events, based on your configuration.

EEM Overview

EEM consists of three major components:

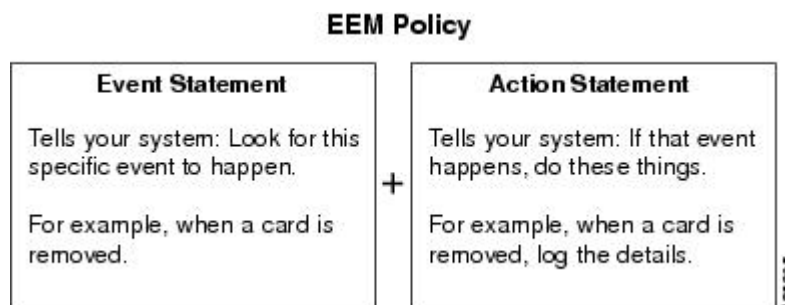
- Event statements—Events to monitor from another Cisco NX-OS component that may require some action, workaround, or notification.
- Action statements—Actions that EEM can take, such as sending an e-mail, or disabling an interface, to recover from an event.
- Policies—A combination of an event statement and an action statement. When the specified event occurs, the configured action is executed.

Policies

An EEM policy consists of an event statement and one or more action statements. The event statement defines the event to look for as well as the filtering characteristics for the event. The action statement defines the action EEM takes when the event occurs.

Figure 1: EEM Policy Statements, on page 2 shows the two basic statements in an EEM policy.

Figure 1: EEM Policy Statements



You can configure EEM policies using the CLI or using a VSH script.



Note EEM policy matching is not supported on MDS switches.

EEM maintains event logs on the supervisor.

Cisco NX-OS has a number of preconfigured system policies. These system policies define many common events and actions for the device. System policy names begin with two underscore characters (__).

The following are some of the preconfigured system policies available in Cisco MDS 9000 Series Switches:

- Zone
 - `__zone_dbsize_max_per_vsan` : Syslog warning when Zone database size exceeds the max limit of 4000000 bytes for a vsan.
 - `__zone_members_max_per_sw`: Syslog warning when Zone member count exceeds the max limit of 32000 for the switch.
 - `__zone_zones_max_per_sw`: Syslog warning when Zone count exceeds the max limit of 16000 for the switch.

- `__zone_zonesets_max_per_sw`: Syslog warning when Zoneset count exceeds the max limit of 1000 for the switch.
- `__zone_member_fan_out_ratio`: Syslog warning when the number of devices exceed the specified fan-out-ratio limit.
- Fabric Login (FLOGI)
 - `__flogi_fcids_max_per_switch`: Syslog warning when the number of flogis in the switch exceeds 2000.
 - `__flogi_fcids_max_per_module`: Syslog warning when the number of flogis in the module exceeds 400.
 - `__flogi_fcids_max_per_intf`: Syslog warning when the number of flogis on the interface exceeds 256.



Note All the above three FLOGI policies are overridable.

- Fibre Channel Name Server (FCNS)
 - `__fcns_entries_max_per_switch` : Configuring max limit for Name server entries verified across all VSANs per switch.

Action: Display a syslog



Note User should not configure an event for a different component's policy.

You can create user policies to suit your network. Actions defined by the user policies are executed along with the actions defined by the system policies. To configure a user policy, see the [Defining a User Policy Using the CLI, on page 7](#).

You can also override some system policies. The override policies replace the system policies. You can override the event or the actions.

Use the **show event manager system-policy** command to view the preconfigured system policies and determine which policies that you can override.

To configure an overriding policy, see the [Overriding a Policy, on page 16](#).



Note You should use the **show running-config eem** command to check the configuration of each policy. An override policy that consists of an event statement and no action statement triggers no action and no notification of failures.



Note Your override policy should always include an event statement. An override policy without an event statement overrides all possible events in the system policy.

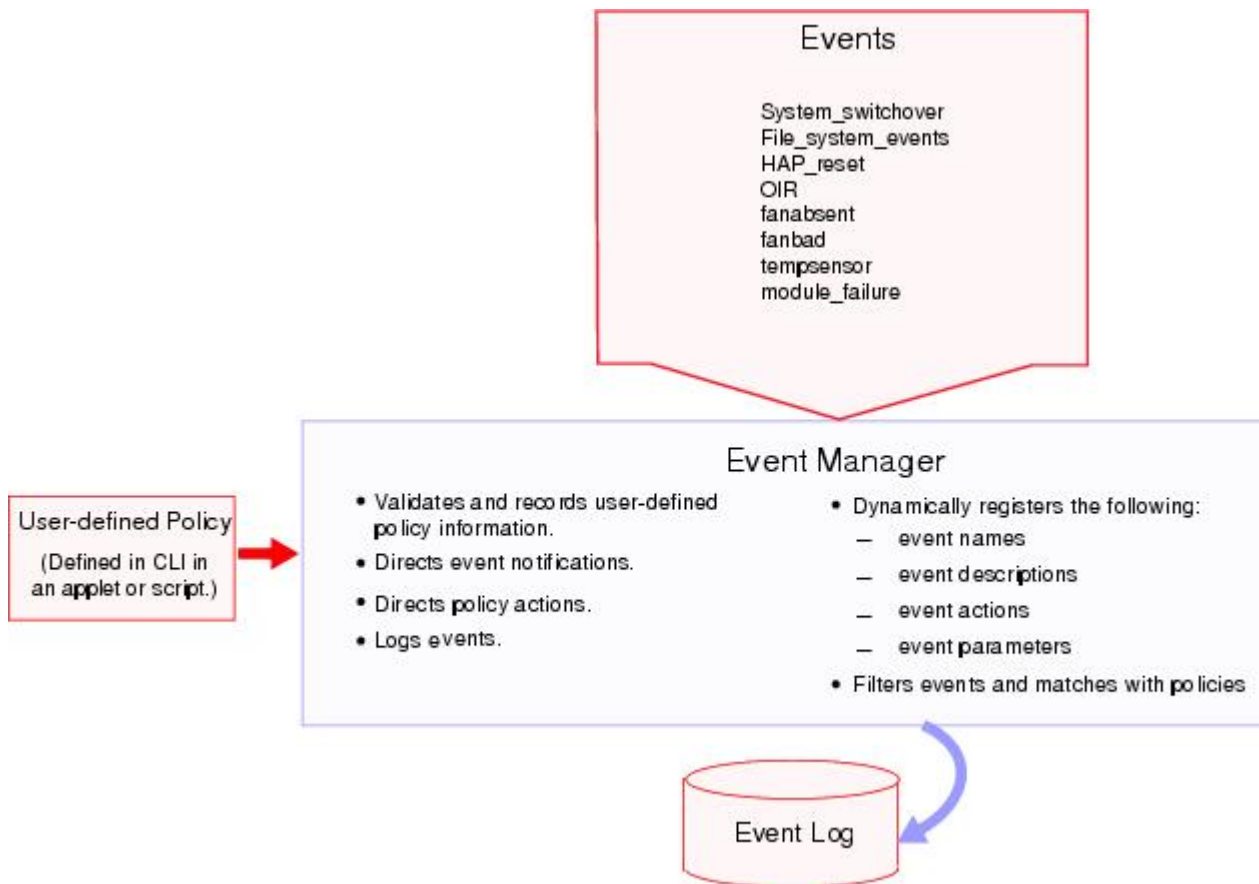
Event Statements

An event is any device activity for which some action, such as a workaround or a notification, should be taken. In many cases, these events are related to faults in the device such as when an interface or a fan malfunctions.

[Figure 2: EEM Overview, on page 4](#) EEM defines event filters so only critical events or multiple occurrences of an event within a specified time period trigger an associated action.

shows events that are handled by EEM.

Figure 2: EEM Overview



Event statements specify the event that triggers a policy to run. You can configure only one event statement per policy.

EEM schedules and runs policies on the basis of event statements. EEM examines the event and action commands and runs them as defined.

Action Statements

Action statements describe the action triggered by a policy. Each policy can have multiple action statements. If no action is associated with a policy, EEM still observes events but takes no actions.

EEM supports the following actions in action statements:

- Execute any CLI commands.
- Update a counter.
- Log an exception.
- Force the shut down of any module.
- Reload the device.
- Shut down specified modules because the power is over budget.
- Generate a syslog message.
- Generate a Call Home event.
- Generate an SNMP notification.
- Use the default action for the system policy.



Note If you want to allow the triggered event to process the default actions also, you must explicitly configure an EEM action with event-default or policy-default, based on the type of policy. For example, if you match a CLI command in a match statement, you must add the event-default action statement to the EEM policy. If the event-default action statement is not added, EEM will not allow the CLI command to execute.



Note Verify that your action statements within your user policy or overriding policy do not negate each other or adversely affect the associated system policy.

VSH Script Policies

You can also write policies in a VSH script, using a text editor. These policies have an event statement and action statement(s) just as other policies, and these policies can either augment or override system policies. After you write your script policy, copy it to the device and activate it. To configure a policy in a script, see the [Defining a Policy Using a VSH Script, on page 15](#).

Environment Variables

You can define environment variables for EEM that are available for all policies. Environment variables are useful for configuring common values that you can use in multiple policies. For example, you can create an environment variable for the IP address of an external e-mail server.

You can use an environment variable in action statements by using the parameter substitution format.

Action Statement

The following example shows a sample action statement to force a module 1 shutdown, with a reset reason of “EEM action.”

```
switch (config-eem-policy)# action 1.0 forceshut module 1 reset-reason "EEM action"
```

Action Statement with Environment Variable

If you define an environment variable for the shutdown reason, called default-reason, you can replace that reset reason with the environment variable, as shown in following example.

```
switch (config-eem-policy)# action 1.0 forceshut module 1 reset-reason $default-reason
```

You can reuse this environment variable in any policy. For more information on environment variables, see the [Defining an Environment Variable, on page 17](#).

EEM Event Correlation

Beginning with Cisco NX-OS Release 5.2, you can trigger an EEM policy based on a combination of events. First, you use the **tag** keyword to create and differentiate multiple events in the EEM policy. Then using a set of boolean operators (**and**, **or**, and **not**), along with the count and time, you can define a combination of these events to trigger a custom action.

High Availability

Cisco NX-OS supports stateless restarts for EEM. After a reboot or supervisor switchover, Cisco NX-OS applies the running configuration.

Licensing Requirements for EEM

The following table shows the licensing requirements for this feature:

Product	License Requirement
NX-OS	EEM requires no license. Any feature not included in a license package is bundled with the Cisco NX-OS system images and is provided at no extra charge to you.

Prerequisites for EEM

EEM has the following prerequisites:

- You must have network-admin user privileges to configure EEM.

Guidelines and Limitations

EEM has the following configuration guidelines and limitations:

- Action statements within your user policy or overriding policy should not negate each other or adversely affect the associated system policy.
- If you want to allow the triggered event to process the default actions also, you must explicitly configure an EEM action with `event-default` or `policy-default`, based on the type of policy. For example, if you match a CLI command in a match statement, you must add the `event-default` action statement to the EEM policy or EEM will not allow the CLI command to execute.
- An override policy that consists of an event statement and no action statement triggers no action and no notification of failures.
- An override policy without an event statement overrides all possible events in the system policy.
- When more than one event statement is included in an EEM policy, each event statement must have a `tag` keyword with a unique tag argument.

Default Settings

Table 2: Default EEM Parameters , on page 7 lists the default settings for EEM parameters.

Table 2: Default EEM Parameters

Parameters	Default
system policies	active

Configuring Embedded Event Manager

Defining a User Policy Using the CLI

You can define a user policy using the CLI.

To define a user policy using the CLI, follow these steps:

Procedure

-
- Step 1** **configure terminal**
Enters configuration mode.
- Step 2** **event manager applet** *applet-name*
Registers the applet with EEM and enters applet configuration mode. The *applet-name* can be any case-sensitive alphanumeric string up to 29 characters.
- Step 3** **description** *policy-description*
(Optional) Configures a descriptive string for the policy. The string can be any alphanumeric string up to 80 characters. Enclose the string in quotation marks.
- Step 4** **event** *event-statement*
Configures the event statement for the policy. See the [Configuring Event Statements, on page 8](#).

- Step 5** Do one of the following:
- **tag** *tagname1* {**and** | **andnot**} *tagname2* [{**and** | **andnot**} *tagname3* [{**and** | **andnot**} *tagname4*]] **happens** *occurs* **in** *seconds*
- (Optional) Correlates multiple events in the policy.
- The range for *occurs* is from 1 to 4294967295. The range for *seconds* is from 0 to 4294967295 seconds.
- Step 6** **action** *action-statement*
- Configures an action statement for the policy. See the [Configuring Action Statements, on page 12](#).
- Repeat Step 5 for multiple action statements.
- Step 7** **show event manager policy internal** *name*
- (Optional) Displays information about the configured policy.
- Step 8** **copy running-config startup-config**
- (Optional) Saves this configuration change.

Configuring Event Statements

To configure an event statement, use one the following commands in EEM configuration mode:

Command	Purpose
event cli [tag <i>tag_name</i> match <i>expression</i>] [count <i>repeats</i> time <i>seconds</i>]	Triggers an event if you enter a CLI command that matches the regular expression. The tag <i>tag_name</i> keyword-argument pair identifies this specific event when multiple events are included in the policy. The <i>repeats</i> range is from 1 to 65000. The time range, in seconds, is from 0 to 4294967295, where 0 indicates no time limit.
event counter <i>name</i> <i>counter</i> entry-val <i>entry</i> entry-op { eq ge gt le lt ne } [exit-val <i>exit</i> exit-op <i>exit</i> { eq ge gt le lt ne }]	Triggers an event if the counter crosses the entry threshold (based on the entry operation—greater than, less than, and so on.) The event resets immediately. Optionally, you can configure the event to reset after the counter passes the exit threshold. The <i>counter</i> name can be any case-sensitive, alphanumeric string up to 28 characters. The <i>entry</i> and <i>exit</i> value ranges are from 0 to 2147483647.

Command	Purpose
event fanabsent [<i>fan number</i>] time <i>seconds</i>	Triggers an event if a fan is removed from the device for more than the configured time, in seconds. The fan number range is dependent on different switches (for example for 9513 switches the range is from 1 to 2, for 9506/9509 switches the range is 1). The seconds range is from 10 to 64000.
event fanbad [<i>fan number</i>] time <i>seconds</i>	Triggers an event if a fan fails for more than the configured time, in seconds. The fan number range is dependent on different switches (for example for 9513 switches the range is from 1 to 2, for 9506/9509 switches the range is 1). The seconds range is from 10 to 64000.
event memory { critical minor severe }	Triggers an event if a memory threshold is crossed.
event module-failure <i>type failure-type</i> module { <i>slot</i> all } { <i>slot</i> count <i>repeats</i> [time <i>seconds</i>]	Triggers an event if a module experiences the failure type configured. The <i>slot</i> range is dependent on different switches (for example for 9513 switches the range is from 1 to 13, for 9509 switches the range is 1 to 9). The <i>repeats</i> range is from 0 to 4294967295. The <i>seconds</i> range is from 0 to 4294967295.
event oir { fan module powersupply } { anyoir insert remove [<i>number</i>]}	Triggers an event if the configured device element (fan, module, or power supply) is inserted or removed from the device. You can optionally configure a specific fan, module, or power supply number. The <i>number</i> range is as follows: <ul style="list-style-type: none"> • Fan number is dependent on different switches. • Module number is dependent on different switches. • Power supply number range is from 1 to 2.
event policy-default count <i>repeats</i> [time <i>seconds</i>]	Uses the event configured in the system policy. Use this option for overriding policies. The <i>repeats</i> range is from 1 to 65000. The <i>seconds</i> range is from 0 to 4294967295.
event poweroverbudget	Triggers an event if the power budget exceeds the capacity of the configured power supplies.

Command	Purpose
event snmp oid <i>oid</i> get-type { exact next } entry-op { eq ge gt le lt ne } entry-val <i>entry</i> [exit-comb { and or }] exit-op { eq ge gt le lt ne } exit-val <i>exit</i> exit-time <i>time</i> polling-interval <i>interval</i>	<p>Triggers an event if the SNMP OID crosses the entry threshold (based on the entry operation—greater than, less than, and so on.)</p> <p>The event resets immediately, or optionally you can configure the event to reset after the counter passes the exit threshold. The OID is in dotted decimal notation. The <i>entry</i> and <i>exit</i> value ranges are from 0 to 18446744073709551615. The time range is from 0 to 2147483647. The interval range is from 1 to 2147483647.</p>

Command	Purpose
<p>event syslog {occurs occurs number pattern syslog pattern period time intervals priority syslog priority tag tag_name }</p>	<p>Triggers an event based on a message logged in the syslog logfile.</p> <p>occurs occurs number-Specifies the number of occurrences. The range is from 1 to 65000.</p> <p>pattern syslog pattern-Specifies the syslog pattern. Normal regular expression pattern matching is used. The maximum size is 256 alphanumeric characters.</p> <p>period time intervals-Specifies the maximum time interval between messages. The range is from 0 to 4294967295 seconds.</p> <p>priority syslog priority-Specifies the syslog priority.</p> <ul style="list-style-type: none"> • alerts—Specifies the alert log message • critical—Specifies the critical log message • debugging—Specifies the debugging message • emergencies—Specifies the emergency log message • errors—Specifies the error log message • informational—Specifies the informational log message • notification—Specifies the notification log message • pattern—Specifies the pattern matching • warnings—Specifies the warning message <p>tag tag_name-Specifies the tag name. Maximum size is 29 alphanumeric characters.</p> <p>The tag tag_name keyword argument pair identifies this specific event when multiple events are included in the policy.</p>
<p>event temperature [module slot] [sensor sensor number]threshold {any major minor}</p>	<p>Triggers an event if the temperature sensor exceeds the configured threshold. The <i>slot</i> range is dependent on different switches. The sensor range is from 1 to 8 on MDS modules, but current MDS modules use the range from 1 to 3 only, some modules use the range from 1 to 2.</p>

Configuring Action Statements

Use the following commands in EEM configuration mode to configure action statements:

Command	Purpose
action <i>number</i> add <i>variable-name</i>	Adds variable values to the action command when an EEM applet is triggered. To undo the add action, use the no form of this command.
action <i>number</i> append <i>variable-name</i>	Appends a variable value to an existing variable string when an EEM applet is triggered. To undo the append action, use the no form of this command.
action <i>number</i> break	Exits from a loop of action when an EEM applet is triggered. To disable the break action, use the no form of this command.
action <i>number</i> cli command <i>command-name</i>	Executes the configured VSH CLI commands when an EEM applet is triggered. To disable the CLI command action, use the no form of this command. Valid value for the VSH command name is 256 characters. From Cisco MDS NX-OS Release 8.1(1) the command keyword was added. The command keyword specifies the message to be sent to the Cisco NX-OS CLI. Add the command name within double quotation marks.
action <i>number</i> cli local command <i>command-name</i>	Executes the action commands in the same card on which an event is triggered. To disable the action cli local command , use the no form of this command. Valid value for the VSH command name is 256 characters. From Cisco MDS NX-OS Release 8.1(1), the command keyword was added. The command keyword specifies the message to be sent to the Cisco NX-OS CLI. Add the command name within double quotation marks.
action <i>number</i> comment <i>string</i>	Specifies an action of adding comments to an applet when an EEM applet is triggered. To disable the comment action, use the no form of this command. Valid value for string sequence is 256 characters.
action <i>number</i> continue	Specifies an action of continuing with loop of actions when an EEM applet is triggered. To disable the comment action, use the no form of this command.
action <i>number</i> [<i>, number</i>] counter <i>name</i> <i>counter</i> value <i>val</i> op { dec inc nop set }	Modifies the counter by the configured value and operation. The action label is in the format <i>number1.number2</i> . <i>number</i> can be any number up to 16 digits. The range for <i>number2</i> is from 0 to 9. The counter name can be any case-sensitive, alphanumeric string up to 29 characters. The <i>val</i> can be an integer from 0 to 2147483647 or a substituted parameter.
action <i>number</i> decrement <i>decrement-name</i>	Specifies the action of decrementing the value of a variable, when an EEM applet is triggered. To remove the action from the applet, use the no form of this command.

Command	Purpose
action <i>number</i> divide <i>divide-name</i>	Divides the dividend value by the given divisor value when an EEM applet is triggered. To remove the calculation process, use the no form of this command.
action <i>number</i> eem	Specifies the EEM action command when an EEM applet is triggered. To remove the EEM action command, use the no form of this command.
action <i>number</i> else	Specifies the beginning of an else conditional action block in an if/else conditional action block when an EEM applet is triggered. To remove the else conditional action block, use the no form of this command.
action <i>number</i> elseif	Specifies the beginning of an elseif conditional action block in an if/else conditional action block when an EEM applet is triggered. To remove the else conditional action block, use the no form of this command.
action <i>number</i> end	Specifies the end of a conditional action block in the if/else and while conditional action block when an EEM applet is triggered. To remove the end conditional action block, use the no form of this command.
action <i>number</i> [<i>. number</i>] event-default	Executes the default action for the associated event. The action label is in the format <i>number1.number2</i> . <i>number</i> can be any number up to 16 digits. The range for <i>number2</i> is from 0 to 9.
action <i>number</i> exit	Exits from the running applet configuration when an EEM applet is triggered. To cancel the process of immediate exit from the running applet, use the no form of this command.
action <i>number</i> file { close delete gets open puts read write }	Configures the EEM applet file operations, use the action file command in applet configuration mode. To disable the configuration, use the no form of this command.
action <i>number</i> foreach <i>foreach-name</i>	Specifies the iteration of an input string using the delimiter as a tokenizing pattern. To remove iteration of the input string, use the no form of this command.
action <i>number</i> if <i>if-name</i>	Identifies the beginning of an if conditional block when an EEM applet is triggered, use the action if command in applet configuration mode. To remove the if conditional action block, use the no form of this command.
action <i>number</i> increment <i>increment-name</i>	Specifies the action of incrementing the value of a variable, when an EEM applet is triggered. To remove the action from the applet, use the no form of this command.
action <i>number</i> multiply <i>multiply-name</i>	Specifies the action of multiplying the variable value with a specified given integer value when an EEM applet is triggered. To remove the calculation process, use the no form of this command.
action <i>number</i> overbudgetshut [module <i>module-name</i>]	Forces one or more modules or the entire system to shut down because of a power overbudget issue.

Command	Purpose
action <i>number</i> policy-default	Executes the default action for the policy that you are overriding. To remove the action policy command from the configuration, use the no form of this command.
action <i>number</i> publish-event	Specifies the action of publishing an application-specific event when the event specified for an EEM applet is triggered. To remove the action of publishing an application-specific event, use the no form of this command.
action <i>number</i> puts	Enables the action of printing data directly to the local TTY when an EEM applet is triggered. To disable this function, use the no form of this command.
action <i>number</i> regex <i>regex-name</i>	Matches a regular expression pattern on an input string when an EEM applet is triggered. To disable this function, use the no form of this command.
action <i>number</i> reload	Forces one or more modules or the entire system to reload.
action <i>number</i> set <i>set-name</i>	Sets the value of a variable when an EEM applet is triggered. To remove the value of an EEM applet variable, use the no form of this command.
action <i>number</i> [. <i>number2</i>] snmp-trap {[<i>intdata1</i> <i>data</i> [<i>intdata2</i> <i>data</i> [<i>strdata</i> <i>string</i>]]]}	Sends an SNMP trap with the configured data. <i>number</i> can be any number up to 16 digits. The range for <i>number2</i> is from 0 to 9. The <i>data</i> arguments can be any number up to 80 digits. The <i>string</i> can be any alphanumeric string up to 80 characters.
action <i>number</i> string	Specifies the string action command for an EEM applet. To remove the action of string operation, use the no form of this command.
action <i>number</i> wait <i>wait-value</i>	Specifies the wait time for an action for an EEM applet. To disable this function, use the no form of this command.
action <i>number</i> while <i>while-number</i>	Identifies the beginning of a loop of a conditional block when an EEM applet is triggered. To disable this function, use the no form of this command.
action <i>number</i> [. <i>number2</i>] exceptionlog <i>module</i> <i>module</i> syserr <i>error</i> devid <i>id</i> errtype <i>type</i> errcode <i>code</i> phylayer <i>layer</i> ports <i>list</i> harderror <i>error</i> [<i>desc</i> <i>string</i>]	Logs an exception if the specific conditions are encountered when an EEM applet is triggered.
action <i>number</i> [. <i>number</i> <i>number2</i>] forceshut [<i>module</i> <i>slot</i> xbar <i>xbar</i> <i>number</i>] reset-reason <i>seconds</i>	Forces a module, crossbar, or the entire system to shut down. The action label is in the format <i>number1.number2</i> . <i>number</i> can be any number up to 16 digits. The range for <i>number2</i> is from 0 to 9. The <i>slot</i> range is dependent on different switches. The <i>xbar-number</i> range is from 1 to 2 and is only available on MDS 9513 modules. The reset reason is a quoted alphanumeric string up to 80 characters.

Command	Purpose
action <i>number</i> [. <i>number</i>] overbudgetshut [module <i>slot</i> [- <i>slot</i>]]	Forces one or more modules or the entire system to shut down because of a power overbudget issue. <i>number</i> can be any number up to 16 digits. The range for <i>number2</i> is from 0 to 9. The <i>slot</i> range is dependent on different switches.
action <i>number</i> [. <i>number</i>] policy-default	Executes the default action for the policy that you are overriding. The action label is in the format <i>number1.number2</i> . <i>number</i> can be any number up to 16 digits. The range for <i>number2</i> is from 0 to 9.
action <i>number</i> [. <i>number</i>] reload [module <i>slot</i> [- <i>slot</i>]]	Forces one or more modules or the entire system to reload. <i>number</i> can be any number up to 16 digits. The range for <i>number2</i> is from 0 to 9. The <i>slot</i> range is dependent on different switches.
action <i>number</i> [. <i>number2</i>] syslog [priority <i>prio-val</i>] msg <i>error</i> <i>message</i>	Sends a customized syslog message at the configured priority. <i>number</i> can be any number up to 16 digits. The range for <i>number2</i> is from 0 to 9. The <i>error-message</i> can be any quoted alphanumeric string up to 256 characters.



Note If you want to allow the triggered event to process the default actions also, you must explicitly configure an EEM action with `event-default` or `policy-default`, based on the type of policy. For example, if you match a CLI command in a match statement, you must add the `event-default` action statement to the EEM policy or EEM will not allow the CLI command to execute. You can bypass all CLI-based EEM policies using the **terminal event-manager bypass** command. To revert use the **terminal no event-manager bypass** command.

Defining a Policy Using a VSH Script

To define a policy using a VSH script, follow these steps:

Procedure

-
- Step 1** In a text editor, list the CLI commands that define the policy.
 - Step 2** Name the text file and save it.
 - Step 3** Copy the file to the following system directory:
bootflash://eem/user_script_policies
-

Registering and Activating a VSH Script Policy

To register and activate a policy defined in a VSH script, follow these steps:

Procedure

- Step 1** **configure terminal**
Enters configuration mode.
- Step 2** **event manager policy** *policy-script*
Registers and activates an EEM script policy. The *policy-script* can be any case-sensitive alphanumeric string up to 29 characters.
- Step 3** **show event manager internal policy** *name*
(Optional) Displays information about the configured policy.
- Step 4** **copy running-config startup-config**
(Optional) Saves this configuration change.
-

Overriding a Policy

To override a system policy, follow these steps:

Procedure

- Step 1** **configure terminal**
Enters configuration mode.
- Step 2** **show event manager policy-state** *system-policy*
(Optional) Displays information about the system policy that you want to override, including thresholds. Use the **show event manager system-policy** command to find the system policy names.
- Step 3** **[no] event manager applet** *applet-name* **override** *system-policy*
Overrides a system policy and enters applet configuration mode. The *applet-name* can be any case-sensitive alphanumeric string up to 29 characters. The *system-policy* must be one of the existing system policies.
- Step 4** **description** *policy-description*
(Optional) Configures a descriptive string for the policy. The string can be any alphanumeric string up to 80 characters. Enclose the string in quotation marks.
- Step 5** **[no] event** *event-statement*
Configures the event statement for the policy. See the [Configuring Event Statements, on page 8](#). Using the **no** keyword deletes the overridden event, if any.

- Deleting an overridden policy does not remove the default system policy.
- You can modify an overridden policy by changing the respective Zone, FCNS, or FLOGI limit values.

Step 6 **action** *action-statement*

Configures an action statement for the policy. See the [Configuring Action Statements, on page 12](#).

Repeat Step 6 for multiple action statements.

- Zone, FLOGI, and FCNS support only syslog message generation as the action.
- If an action is not configured, the default action associated with the default system policy is executed. If an action is configured, both the configured and default actions are executed. This functionality is applicable only to Zone, FLOGI, and FCNS system policies.

Step 7 **show event manager policy-state** *name*

(Optional) Displays information about the configured policy.

Step 8 **copy running-config startup-config**

(Optional) Saves this configuration change.

Note Multiple overrides for Zone, FLOGI, and FCNS EEM policies are not allowed.

Defining an Environment Variable

To define a variable to serve as a parameter in an EEM policy, follow these steps:

Procedure

Step 1 **configure terminal**

Enters configuration mode.

Step 2 **event manager environment** *variable-name variable-value*

Creates an environment variable for EEM. The *variable-name* can be any case-sensitive alphanumeric string up to 29 characters. The *variable-value* can be any quoted alphanumeric string up to 39 characters.

Step 3 **show event manager environment**

(Optional) Displays information about the configured environment variables.

Step 4 **copy running-config startup-config**

(Optional) Saves this configuration change.

Verifying the EEM Configuration

To display EEM configuration information, perform one of the following tasks:

Command	Purpose
show event manager environment [<i>variable-name</i> all]	Displays information about the event manager environment variables.
show event manager event-types [<i>event</i> all module <i>slot</i>]	Displays information about the event manager event types.
show event manager history events [detail] [maximum <i>num-events</i>] [severity { catastrophic minor moderate severe }]	Displays the history of events for all policies.
show event manager policy internal [<i>policy-name</i>] [inactive]	Displays information about the configured policies.
show event manager policy-state <i>policy-name</i>	Displays information about policy state, including thresholds.
show event manager script system [<i>policy-name</i>] all]	Displays information about the script policies.
show event manager system-policy [all]	Displays information about the predefined system policies.
show running-config eem	Displays information about the running configuration for EEM.
show startup-config eem	Displays information about the startup configuration for EEM.

Configuration Examples for EEM

This example overrides the `__lcm_module_failure` system policy by changing the threshold for just module 3 hitless upgrade failures. The following example also sends a syslog message. The settings in the system policy, `__lcm_module_failure`, apply in all other cases.

```
event manager applet example2 override __lcm_module_failure
  event module-failure type hitless-upgrade-failure module 3 count 2
  action 1 syslog priority errors msg module 3 "upgrade is not a hitless upgrade!"
  action 2 policy-default
```

The following example modifies an overridden policy by changing the number of FCNS database entries to 1500. It also generates both the configured and the default syslog messages of the default system policy

```
event manager applet fcns_policy override __fcns_entries_max_per_switch
  event fcns entries max-per-switch 1500
```

```
action 1.0 syslog priority warnings msg FCNS DB entries have reached the EEM limit
```

The following example deletes the event of an overridden policy:

```
no event manager applet zone_policy
```

The following example creates an EEM policy that allows the CLI command to execute but triggers an SNMP notification when a user enters configuration mode on the device:

```
event manager applet TEST
event cli match "conf t"
action 1.0 snmp-trap strdata "Configuration change"
action 2.0 event-default
```



Note You must add the event-default action statement to the EEM policy or EEM will not allow the CLI command to execute.

The following example shows how to configure a VSH command string to be executed when an EEM applet is triggered:

```
switch# configure terminal
switch(config)# event manager applet cli-applet
switch(config-applet)# action 1.0 cli command "show interface e 3/1"
```

Additional References

For additional information related to implementing EEM, see the following section:

MIBs

MIBs	MIBs Link
<ul style="list-style-type: none"> CISCO-EMBEDDED-EVENT-MGR-MIB 	To locate and download MIBs, go to the following URL: http://www.cisco.com/en/US/products/ps5989/prod_technical_reference_list.html

